

## CLAIMS

We claim:

- 1 1. A method for designing, deploying or optimizing a communications  
2 network, comprising the steps of:  
3       providing a computerized model which represents a physical  
4 environment in which a communications network is or will be installed,  
5 said computerized model providing a display of at least a portion of said  
6 physical environment;  
7       providing performance attributes for a plurality of system  
8 components which may be used in said physical environment;  
9       selecting specific components from said plurality of system  
10 components for use in said computerized model;  
11       representing said selected specific components in said display;  
12       selecting specific points within said display where performance  
13 data is desired;  
14       running prediction models using the computerized model and said  
15 performance attributes to predict performance characteristics of a  
16 communications network composed of said selected specific components,  
17 said prediction models providing predicted performance data for said  
18 selected specific points; and  
19       displaying results from said prediction models on said display at  
20 said selected specific points in the form of one or more icons.
- 1 2. The method of claim 1 wherein said display is three dimensional.
- 1 3. The method of claim 1 wherein said icon is three dimensional.
- 1 4. The method of claim 1 wherein both said display and said icons are

2 three dimensional.

1 5. The method of claim 4 wherein said icon is depicted as a graphical  
2 cylinder where an attribute selected from the group consisting of height,  
3 radius, brightness, color, hue, saturation, line type and width, transparency,  
4 and surface texture varies depending on the performance data.

1 6. The method of claim 4 wherein said icon has an attribute selected from  
2 the group consisting of height, radius, brightness, color, hue, saturation,  
3 line type and width, transparency, and surface texture varies depending on  
4 the performance data.

1 7. An apparatus for designing, deploying or optimizing a communications  
2 network, comprising:

3 a means for providing a computerized model which represents a  
4 physical environment in which a communications network is or will be  
5 installed, said computerized model providing a display of at least a portion  
6 of said physical environment;

7 a means for providing performance attributes for a plurality of  
8 system components which may be used in said physical environment;

9 a means for selecting specific components from said plurality of  
10 system components for use in said computerized model;

11 a means for representing said selected specific components in said  
12 display;

13 a means for selecting specific points within said display where  
14 performance data is desired;

15 a means for running prediction models using the computerized  
16 model and said performance attributes to predict performance  
17 characteristics of a communications network composed of said selected  
18 specific components, said prediction models providing predicted

256036AA

19 performance data for said selected specific points; and  
20 a means for displaying results from said prediction models on said  
21 display at said selected specific points in the form of one or more icons.

1 8. The apparatus of claim 7 wherein said display is three dimensional.

1 9. The apparatus of claim 7 wherein said icon is three dimensional.

1 10. The apparatus of claim 7 wherein both said display and said icon is  
2 three dimensional.

1 11. The apparatus of claim 10 wherein said icon is depicted as a graphical  
2 cylinder where an attribute selected from the group consisting of height,  
3 radius, brightness, color, hue, saturation, line type and width, transparency,  
4 and surface texture varies depending on the performance data.

1 12. The apparatus of claim 10 wherein said icon has an attribute selected  
2 from the group consisting of height, radius, brightness, color, hue,  
3 saturation, line type and width, transparency, and surface texture varies  
4 depending on the performance data.

1 13. A method for designing, deploying or optimizing a communications  
2 network, comprising the steps of:

3 providing a computerized model which represents a physical  
4 environment in which a communications network is or will be installed,  
5 said computerized model providing a display of at least a portion of said  
6 physical environment;

7 providing performance attributes for a plurality of system  
8 components which may be used in said physical environment;  
9 selecting specific components from said plurality of system

256036AA

10 components for use in said computerized model;  
11 representing said selected specific components in said display;  
12 selecting specific points within said display where performance  
13 data is desired;  
14 running prediction models using the computerized model and said  
15 performance attributes to predict performance characteristics of a  
16 communications network composed of said selected specific components,  
17 said prediction models providing predicted performance data for said  
18 selected specific points;  
19 measuring actual performance data for said physical environment;  
20 and  
21 comparing said actual performance data to said predicted  
22 performance data.

1 14. The method of claim 13 further comprising the step of displaying a  
2 comparative result from said comparing step as an icon on said display.

1 15. The method of claim 14 wherein said icon and said display are three  
2 dimensional.

1 16. The method of claim 15 wherein said icon is depicted as a graphical  
2 cylinder where an attribute selected from the group consisting of height,  
3 radius, brightness, color, hue, saturation, line type and width, transparency,  
4 and surface texture varies depending on the performance data.

1 17. The method of claim 15 said icon has an attribute selected from the  
2 group consisting of height, radius, brightness, color, hue, saturation, line  
3 type and width, transparency, and surface texture varies depending on the  
4 performance data.

1 18. A method for designing, deploying or optimizing a communications  
2 network, comprising the steps of:

3 providing a computerized model which represents a physical  
4 environment in which a communications network is or will be installed,  
5 said computerized model providing a display of at least a portion of said  
6 physical environment;

7 providing performance attributes for a plurality of system  
8 components which may be used in said physical environment;

9 selecting specific components from said plurality of system  
10 components for use in said computerized model;

11 representing said selected specific components in said display;

12 selecting specific points within said display where performance  
13 data is desired;

14 running at least two different prediction models using the  
15 computerized model and said performance attributes to predict  
16 performance characteristics of a communications network composed of  
17 said selected specific components, said prediction models providing at  
18 least two predicted performance data for said selected specific points; and  
19 comparing said at least two predicted performance data.

1 19. The method of claim 18 further comprising the step of displaying a  
2 comparative result from said comparing step as an icon on said display.

1 20. The method of claim 19 wherein said icon and said display are three  
2 dimensional.

1 21. The method of claim 20 wherein said icon is depicted as a graphical  
2 cylinder where an attribute selected from the group consisting of height,  
3 radius, brightness, color, hue, saturation, line type and width, transparency,  
4 and surface texture varies depending on the performance data.

1 22. The method of claim 20 wherein said icon has an attribute selected  
2 from the group consisting of height, radius, brightness, color, hue,  
3 saturation, line type and width, transparency, and surface texture varies  
4 depending on the performance data.

1 23. A method for designing, deploying or optimizing a communications  
2 network, comprising the steps of:

3 providing a computerized model which represents a physical  
4 environment in which a communications network is or will be installed,  
5 said computerized model providing a display of at least a portion of said  
6 physical environment;

7 providing performance attributes for a plurality of system  
8 components which may be used in said physical environment;

9 selecting specific components from said plurality of system  
10 components for use in said computerized model;

11 representing said selected specific components in said display;

12 selecting specific points within said display where performance  
13 data is desired;

14 running at least one predictive model using the computerized  
15 model and said performance attributes to predict performance  
16 characteristics of a communications network composed of said selected  
17 specific components, said step of running being performed at least two  
18 times where performance parameters in said predictive model have  
19 changed between said at least two times so as to provide at least two  
20 predicted performance data for said selected specific points; and  
21 comparing said at least two predicted performance data.

1 24. The method of claim 23 further comprising the step of displaying a  
2 comparative result from said comparing step as an icon on said display.

1 25. The method of claim 24 wherein said icon and said display are three  
2 dimensional.

1 26. The method of claim 25 wherein said icon is depicted as a graphical  
2 cylinder where an attribute selected from the group consisting of height,  
3 radius, brightness, color, hue, saturation, line type and width, transparency,  
4 and surface texture varies depending on the performance data.

1 27. The method of claim 25 wherein said icon has an attribute selected  
2 from the group consisting of height, radius, brightness, color, hue,  
3 saturation, line type and width, transparency, and surface texture varies  
4 depending on the performance data.

1 28. A method for designing, deploying or optimizing a communications  
2 network, comprising the steps of:  
3 providing a computerized model which represents a physical  
4 environment in which a communications network is or will be installed,  
5 said computerized model providing a display of at least a portion of said  
6 physical environment;  
7 providing performance attributes for a plurality of system  
8 components which may be used in said physical environment;  
9 selecting specific components from said plurality of system  
10 components for use in said computerized model;  
11 representing said selected specific components in said display;  
12 selecting specific points within said display where performance  
13 data is desired;  
14 measuring actual performance data for said physical environment  
15 which correspond to said specific points, said measuring step being  
16 performed using different measurement devices, or being performed at

256036AA

17 different time periods such that at least two sets of measurement data are  
18 obtained; and  
19 comparing said at least two sets of measurement data.

1 29. The method of claim 28 further comprising the step of displaying a  
2 comparative result from said comparison step as an icon on said display.

1 30. The method of claim 29 wherein said icon and said display are three  
2 dimensional.

1 31. The method of claim 30 wherein said icon is depicted as a graphical  
2 cylinder where an attribute selected from the group consisting of height,  
3 radius, brightness, color, hue, saturation, line type and width, transparency,  
4 and surface texture varies depending on the performance data.

1 32. The method of claim 30 wherein said icon has an attribute selected  
2 from the group consisting of height, radius, brightness, color, hue,  
3 saturation, line type and width, transparency, and surface texture varies  
4 depending on the performance data.

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